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ABSTRACT

In January 1996, the Chancellor's Office of the California Community Colleges prepared a 15-year forecast of enrollment and weekly student contact hours (WSCH) using an econometric model that analyzes real (i.e., price-adjusted) costs facing students, real operating budget expenditures of colleges, population and unemployment projections, and financial constraints. Once enrollment is forecast, future WSCH are calculated from a forecast of trends in academic loads as measured by WSCH per student. Based on the analysis, it was determined that an assumed stable enrollment fee in 1996 will slightly lower the real cost facing students, and this, combined with the end of a $50 per unit differential fee for students with bachelor's degrees and an increase in college budgets, should produce an estimated increase of 5% in college enrollments in fall 1996. Similarly, an improving economy and continuing increases in the state's adult population should result in another 400,000 students by 2005 and another 160,000 by 2010. The analysis also suggested that WSCH would fall slightly until the year 2000, then rise to nearly 9.5 contact hours per student (the highest value since 1973) by 2005, and finally fall toward 9 hours per student by 2010. This forecast is lower than the previous year's because this year's forecast is based on less optimistic assumptions about future college budget revenues. Charts and data tables are included. (MAB)

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ED 394 607

15–YEAR ENROLLMENT AND WSCH FORECAST

CALIFORNIA COMMUNITY COLLEGES

Chancellor's Office 1996 Forecast Using Statewide Data

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Sacramento California
January 1996

JC 960 343

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Chancellor's Office
January 4, 1996

15-YEAR ENROLLMENT AND WSCH FORECAST
CALIFORNIA COMMUNITY COLLEGES

METHODOLOGY

The Chancellor's Office 15-year forecast of enrollment and weekly student contact hours (WSCH) in the California community colleges is carried out using an econometric model in which enrollment is determined by the following independent variables:

1. real (price-adjusted) cost facing students, including fees and other direct costs
2. real operating budget expenditures (current expense of education) of colleges
3. population
4. unemployment
5. financial constraints, pre- and post-Proposition 13 (1978)

The model explains historic community college enrollment fluctuations quite well and with reasonable assumptions about future values of the independent variables, is a useful tool for forecasting enrollment. Once enrollment is forecast, future WSCH are calculated from a forecast of trends in academic loads as measured by WSCH per student. A second econometric model is used to determine the variables that are important in predicting student academic loads.

STATEWIDE RESULTS

Enrollment. Results for the enrollment model (Figure 1 and Table 1) show that it effectively explains historic fluctuations in community college enrollments. While high coefficients of determination (R-squared) are not unusual for time series analyses of this sort, the value for the Durban-Watson statistic - which measures the degree of (serial) correlation in the model's error terms - suggests that we have not omitted anything of major importance in the forecasting model.

Moreover, all independent variables are significantly related to enrollment and carry the appropriate signs; i.e., are related in the expected direction. Enrollment changes are quite sensitive to changes in students' cost, college budgets, and adult population. At slightly smaller orders of magnitude, both unemployment and financial constraints (here defined as pre- and post-Proposition 13 conditions) also play a part in determining enrollment fluctuations.

An assumed stable enrollment fee in 1996 lowers slightly the real cost facing students. This together with the sunset of the $50 per unit differential for students with

baccalaureates, and college budgets that include growth funding should produce an estimated increase of 5% in college enrollments in Fall 1996 over Fall 1995. In subsequent years, with expected funding for both COLA and growth, and moderate increases in student fees, enrollment is estimated by the model to increase at rates varying between 1% and 3%, depending on the interaction of the model's independent variables. A rising economy increases budget, which increases enrollment, while it (a rising economy) reduces unemployment which reduces enrollment. At the same time, continuing increases in adult population increase enrollment. The model combines the consequences of these sometimes-conflicting factors to forecast an added 400,000 (30%) students in community colleges by 2005, and another 160,000 by 2010.

WSCH. A modified form of the enrollment model confirms that academic loads (WSCH per student) fluctuate also with the economy - rising during recession, declining during recovery - due to increasing and decreasing unemployment (Figure 2 and Table 2). As expected, academic load also rises (falls) with increases (decreases) in high school graduates and, therefore, in younger college enrollments. The model also shows that large enrollment increases tend to be composed less of full-time and more of part-time students, and, as a result, WSCH per student falls when enrollment rises substantially. Finally, the real cost of enrollment facing students appears to have no direct impact on the overall average student academic load. See below for a more complete explanation of this.

While enrollment has decreased in the Fall 1995, the $50 fee sunset will add spring enrollment and WSCH. Therefore, as a rough approximation, we assume that total WSCH will be unchanged between 1994-95 and 1995-96. Consequently, WSCH per fall headcount for 1995 (1995-96) will increase slightly.

Because of our assumptions regarding the state's future economic growth and because of increasing numbers of high school graduates, as forecast by the Department of Finance, the forecast values of WSCH per student fall slightly until 2000, then rise to nearly 9.5 (the highest value since 1973) by 2005, then decline toward 9.0 WSCH per student approaching 2010.

Combining the forecasts of enrollment and WSCH per enrollment produces an increase for all colleges of 4.2 million (34% more) WSCH to 16.4 million WSCH by 2005, and generally smaller increases or even slight decreases thereafter (Figure 3 and Table 3).

Forecast Compared. This year's enrollment forecast is somewhat lower than the forecast prepared last year largely because it is based on less optimistic (possibly more realistic) assumptions about available future college budget revenues. (See Figure 4a and and Table 4.) This year's forecast results also are similar to the latest forecast (Figure 4b) produced by the Department of Finance (DOF) and Postsecondary Education Commission (CPEC):

	Forecast for 2005	% Change
Chancellor's Office 1996	1,751,000	30%
DOF 1994	1,718,000	27%
CPEC 1995	1,722,000	28%

Current participation rates (a measure of access) are at their lowest level in 25 years: 66 students per 1,000 adult population (Figure 4c and Table 4). Under our forecast, this rate increases gradually to 72/1,000 by 2005 and to 73/1,000 by 2010. Rates implied in forecasts by DOF and CPEC are just slightly lower).

FTES. The model also may be used to forecast full-time equivalent students (FTES) - the number of students carrying an average of 15 weekly contact hours for the full academic year. Results in Figure 5 and Table 5 for FTES are generally similar to those for headcount enrollment, except that the elasticity for student price, e=-0.8, is lower. We also observe that full-time students are somewhat less responsive - than are part-time students - to increases in the cost of enrollment (Table 6). Evidentally, when the price per unit of the enrollment fee increases, relatively more part-time - than full-time - students withdraw, an event which normally would drive the average WSCH per student up. However, the remaining students lower their academic loads - also in response to the unit-fee increase - and, the result is that the overall average WSCH per student appears unchanged. Thus, FTES (derived from WSCH) are somewhat less responsive to price changes than are headcount enrollments.

Another interesting result of the model, displayed in Table 6, is that the enrollment of full-time students, as expected, does not appear sensitive to fluctuations in the number of unemployed, but is sensitive to changes in the fees charged at the University (UC) and State University (CSU). By contrast, part-time enrollment is sensitive to unemployment, but not to UC and CSU fees (result not shown here).

STATEWIDE ASSUMPTIONS

Besides assuming that community colleges will remain within the funding of Proposition 98, we also assume that sources of capital outlay funding (other than student fees) will be obtained.

In these forecasts, California's economic recovery that began early in 1995 is expected to continue until the year 2000, slow until 2005, then pick up thereafter through 2010, the end of the forecast period. Community college expenditures - supported by Proposition 98 (1988), a funding source that is quite sensitive to economic fluctuations - are also assumed to cycle in a similar five- to six-year fashion (Figure A and Table A).

No changes in student fees are assumed for 1995-96 or 1996-97, apart from the sunset of the $50 differential fee for students with baccalaureate degrees in the Spring 1996. Beginning Fall 1997, it is assumed that direct costs to students (including fees,

transportation, books and supplies, and child care) will increase at the same rate as the cost-of-living (California Consumer Price Index) through the forecast period. Thus, student costs are assumed to be constant in real terms between 1997 and 2010.

Unemployment will continue to cycle with the economy. Based on past experience, unemployment will rise with a slowing (as assumed here) of the state's recovery in 2000, and drop as the economy once again recovers in 2005 (see again Figure 5 and Table 5).

Student academic loads have increased in recent years and are now at their highest level in two decades. After a slight (artificial) increase in 1995 (1995-96) due to the expected increase in spring enrollment, average annual WSCH per fall headcount is expected to cycle with unemployment (see above). And, a factor that could push average student academic load upward is the expected increase in younger - more often full-time - community college students that will result from the increase in numbers of 18 to 24 year-olds and high school graduates beginning this decade (the "baby boom echo").

District Application

The model is applied to individual districts by using the appropriate service area population - primary county adult population or, in a few cases, high school graduates - along with specific district budget outlay and enrollment history. And, it is not possible to use unemployment as an independent variable for individual district forecasts, however, because valid data on unemployment in the districts' service areas are not available.

This year's forecasts for individual districts differ from last year's also because we neither:

(1) reduce a district's WSCH by the proportion of their FTES that exceed the funding cap, nor
(2) adjust expected future budget outlays by the apportionment growth factor that has developed recently for the district.

Both adjustments were used in last year's forecast. They are excluded this year because (1) adjusting for overcap FTES understates the future need for facilities, and (2) use of a static apportionment growth factor to adjust future budgets may not reflect the district's future expenditure flow. Using a statewide fiscal expectation with the district's expected population growth appears to provide a more accurate set of future enrollment determinants.

Calculations of WSCH per student for individual districts also are simplified due to the lack of historical data on the impact that local economic fluctuations and unemployment

have on academic loading. Instead of using the statewide WSCH per student forecast method, we assume that total average annual WSCH in each district remains the same from 1994-95 to 1995-96. Since enrollment has declined in Fall 1995 for many districts, there is a slight (artificial) increase in WSCH per fall headcount for many districts. For 1996 (1996-97), we assume that each district's average WSCH per student will decline by 2% (the estimated statewide average change), reflecting the expected return of more baccalaureate students. After that, beginning 1997, WSCH per student levels in individual districts are assumed to be constant during the remainder of the forecast.

Questions and Comments

If you have questions or comments about this work, please contact the Chancellor's Office: either **Chuck McIntyre**, Director of Research and Analysis, by phone at (916) 327-5887, FAX at (916) 327-5889, or e-mail at cmcintyr@cc1.cccco.edu; or **Chuen-Rong Chan**, Specialist in the Research and Analysis Unit, by phone at (916) 327-5886, FAX (916) 327-5889, or e-mail at cchan@cc1.cccco.edu.

15-YEAR ENROLLMENT AND WSCH FORECAST
CALIFORNIA COMMUNITY COLLEGES

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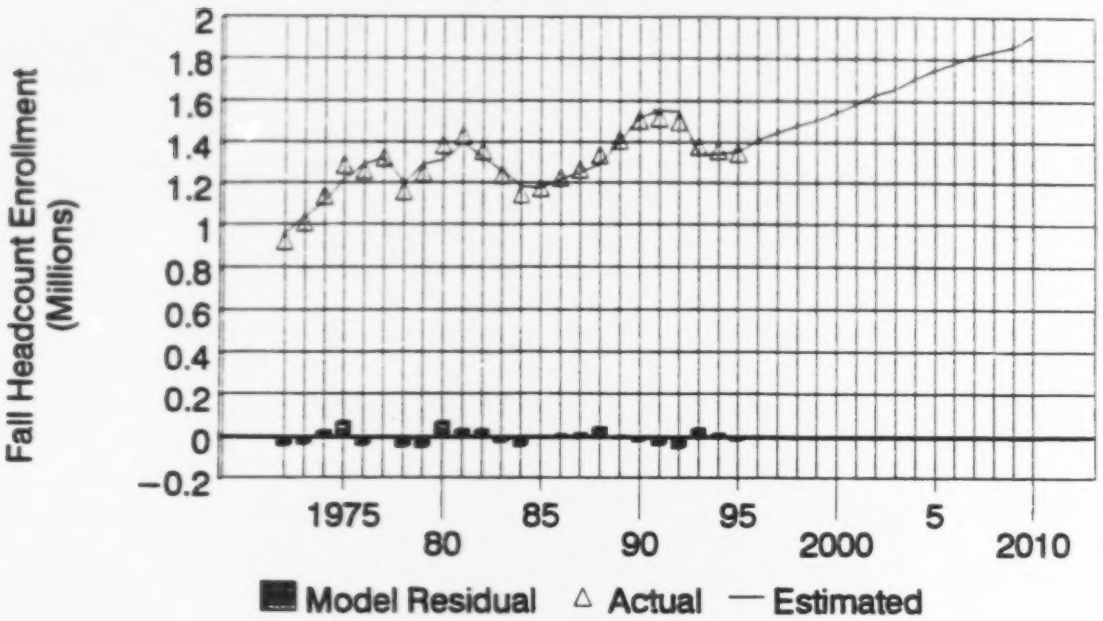
FIGURE 1

15–Year Enrollment Forecast
CALIFORNIA COMMUNITY COLLEGES



CHANCELLOR'S OFFICE 1994 MODEL:

$$E = a + b(P(>17)) + c(B) + d(PR) + e(CA13) + f(UNE) + u$$

where,

E = total fall headcount enrollment
P = adult population cohort
B = current expense of education (CEE) in real $ (adjusted for S&LP index)
PR = annual real $ cost to students for attending (including fees, books and supplies, transportation, and child care)
CA13 = Proposition 13: a "dummy" variable
UNE = unemployed
a...f are regression parameters and u = residual term

CHANCELLOR'S OFFICE 1995 ASSUMPTIONS:

(1) The economic recovery that began in early 1995, slows in 2000, picks up in 2005
(2) Adult population growth as forecast by the Department of Finance.
(3) Student price (PR), including fees + other costs, grows by CPI in future, except:
no change in $13/unit enrollment fee in 1996 (96–97) and
sunset of $50/unit "differential" fee in 1996 (1/96); together with
slight increase in waivers.
(4) Real CEE is unchanged from 1994–95 to 1995–96, then grows by:
2.6% in 1996 (1996–97)
and the following average annual rates:
2.2% between 1995 and 2000
0.7% between 2000 and 2005
2.4% between 2005 and 2010

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TABLE 1	ENROLL	UNEMP	ADULTS	FIN	RCEE'95	RPRC'95	enrollEST.	act−est.
	921900	661168	12172840	0	1891986	1303	958444	−36544
	1010900	663259	12454210	0	2063526	1303	1038857	−27957
	1137700	660140	12680108	0	2221870	1303	1111183	26517
1975	1287400	871378	13009154	0	2392404	1303	1216295	71105
	1257800	925429	13370185	0	2529655	1303	1291835	−34035
	1321800	814000	13729935	0	2597151	1303	1320887	913
	1159800	738000	14143517	1	2607312	1289	1202475	−42675
	1248500	746000	14518930	1	2618690	1234	1293473	−44973
80	1383300	832000	14935808	1	2547014	1217	1312459	70841
	1430800	1043000	15234710	1	2544951	1176	1398244	32556
	1354900	1199000	15565253	1	2385735	1209	1322229	32671
	1239381	1084000	15905036	1	2260410	1219	1260109	−20728
	1144300	971000	16216616	1	2335616	1303	1183575	−39275
85	1175500	912000	16585380	1	2279543	1298	1175251	249
	1225400	840000	16984472	1	2341380	1291	1217674	7726
	1264409	770000	17421544	1	2356145	1276	1251950	12459
	1336275	743000	17895042	1	2416782	1275	1293329	42946
	1407430	780000	18429075	1	2590062	1261	1406304	1126
90	1505381	971000	18971688	1	2741367	1253	1519711	−14330
	1515261	1252000	19294940	1	2725915	1258	1551299	−36038
	1500393	1395000	19604016	1	2693355	1272	1548056	−47663
	1376565	1410000	19849066	1	2641951	1430	1338353	38212
	1357615	1330000	20081300	1	2629935	1423	1343121	14494
95	1346754	1205000	20372479	1	2629935	1412	1354352	−7598
		1138414	20698438	1	2698313	1385	1415077	5.1%
		1055102	21102058	1	2765771	1385	1448973	2.4%
		968109.	21513548	1	2832150	1385	1482339	2.3%
		877236.	21930911	1	2888793	1385	1511589	2.0%
2000		894254.	22356371	1	2932125	1385	1547779	2.4%
		1135703	22714072	1	2932125	1385	1588758	2.6%
		1384649	23077498	1	2932125	1385	1630795	2.6%
		1524037	23446738	1	2932125	1385	1660903	1.8%
		1667532	23821885	1	2976106	1385	1709398	2.9%
5		1694212	24203036	1	3035629	1385	1751420	2.5%
		1598368	24590284	1	3096341	1385	1780562	1.7%
		1499023	24983729	1	3173750	1385	1816280	2.0%
		1269173	25383468	1	3253093	1385	1838540	1.2%
		1031584	25789604	1	3334421	1385	1860994	1.2%
2010		1048089	26202238	1	3417781	1385	1912726	2.8%

REGRESSION:	Constant	1294433				Est.enroll	%Chg
Std Err of Y Est		40525.					
R Squared		0.941				SIGNIF. @1% ?	
No. of Observations		24	F =	72.27		YES	
Degrees of Freedom		18	DW =	1.80		+NO	−NO
	UNEM	ADULTS	FINANCE	RCEE	RPRICE		
X Coefficient(s)	0.111	0.040	−148125	0.402	−1268		
Std Err of Coef.	0.052	0.008	36087	0.052	184		
T Values	2.14	5.21	−4.10	7.78	−6.89		
Elasticity	0.08	0.50	−0.09	0.77	−1.27		

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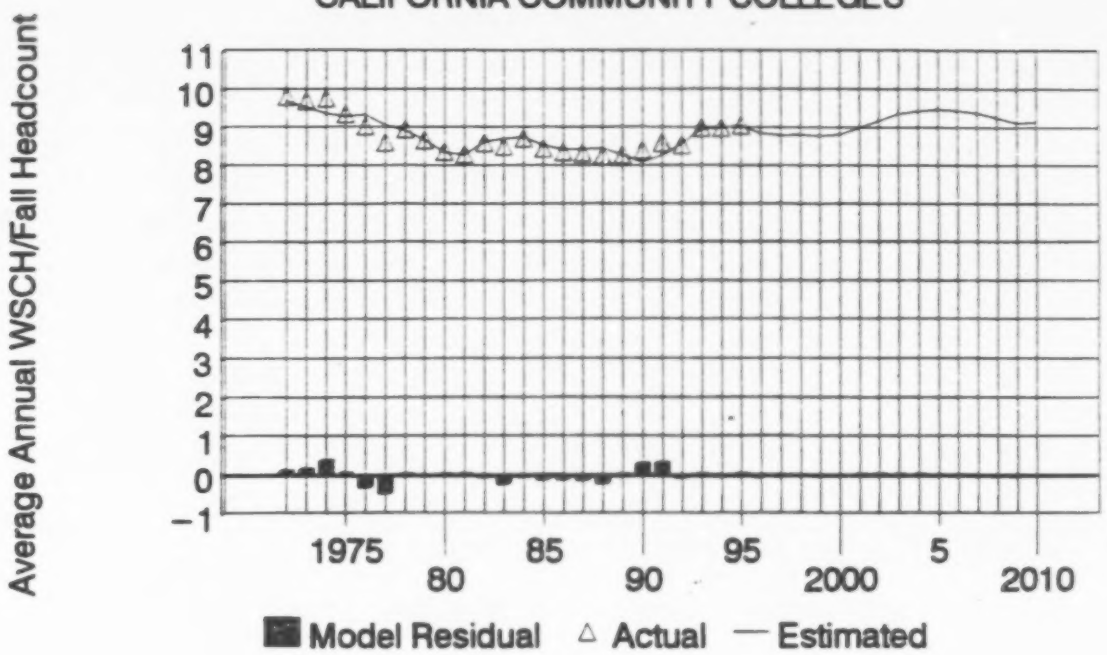
FIGURE 2

15–Year WSCH/Enrollment Forecast
CALIFORNIA COMMUNITY COLLEGES



CHANCELLOR'S OFFICE 1995 MODEL:

$$L = a + b(HSG) + c(E) + d(PR) + e(FIN) + f(UNE) + u$$

where,

L = Average annual weekly student contact hours per fall headcount
E = total fall headcount enrollment
HSG = high school graduates
PR = annual real $ cost to students for attending (including fees, books and supplies, transportation, and child care)
FIN = Finance/Proposition 13: = 0 through 1977, = 1 after
UNE = unemployed
a...f are regression parameters and u = residual term

CHANCELLOR'S OFFICE 1995 ASSUMPTIONS:

(1) The economic recovery that began in early 1995, slows in 2000, picks up in 2005; unemployment cycles in a fashion similar to recent recessions.
(2) High school graduates as forecast by the Department of Finance.
(3) Student price (PR), including fees + other costs, grows by CPI in future, except: no change in $13/unit enrollment fee in 1996 (96–97) and sunset of $50/unit "differential" fee in 1996 (1/96); together with slight increase in waivers.
(4) Enrollment as forecast by the Chancellor's Office, December 1995

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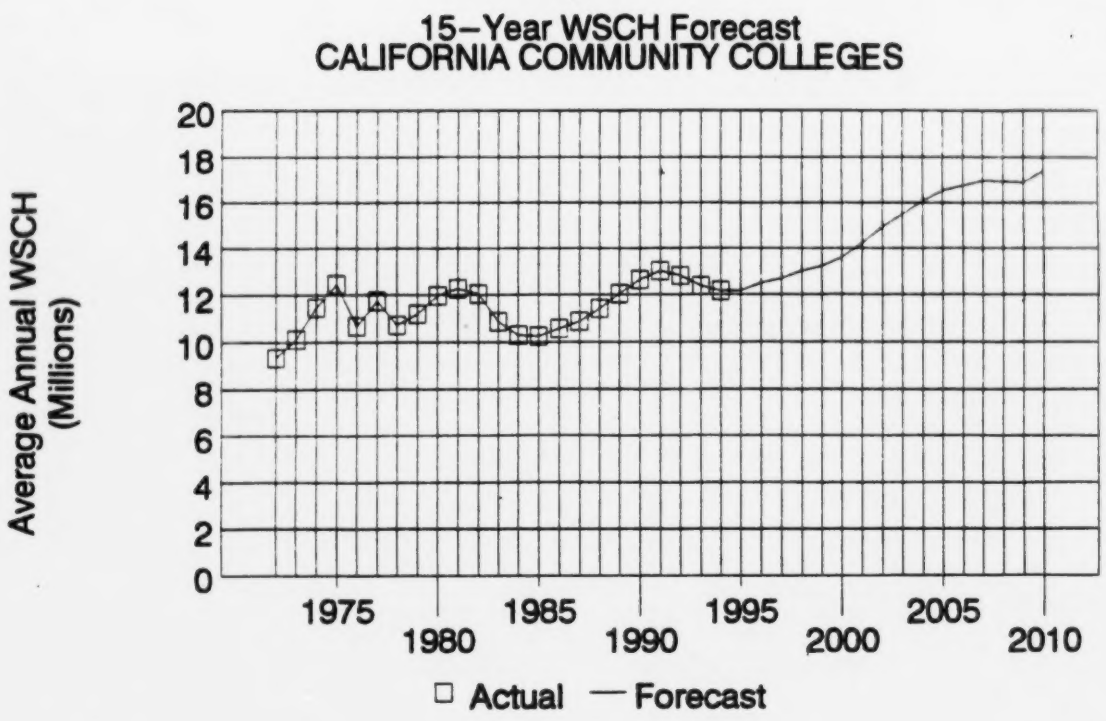
TABLE 2	WSCH/E	UNEMP	HSGRD	ENROLL	FIN	RPR	EST.	act−est.
	9.800	661168	256841	921900	0	1303	9.674	0.126
	9.700	663259	258656	1010900	0	1303	9.533	0.167
	9.751	660140	262934	1137700	0	1303	9.354	0.397
1975	9.343	871378	266770	1287400	0	1303	9.291	0.052
	9.035	925429	262698	1257800	0	1303	9.326	−0.292
	8.608	814000	258982	1321800	0	1303	9.058	−0.450
	8.957	738000	257604	1159800	1	1289	8.926	0.030
	8.671	746000	252800	1248500	1	1234	8.667	0.003
80	8.375	832000	245923	1383300	1	1217	8.361	0.014
	8.291	1043000	236174	1430800	1	1176	8.268	0.022
	8.601	1199000	241343	1354900	1	1209	8.629	−0.027
	8.495	1084000	236897	1239381	1	1219	8.695	−0.200
	8.718	971000	232199	1144300	1	1303	8.745	−0.027
85	8.440	912000	225448	1175500	1	1298	8.532	−0.092
	8.355	840000	229026	1225400	1	1291	8.433	−0.078
	8.326	770000	237414	1264409	1	1276	8.429	−0.103
	8.265	743000	249518	1336275	1	1275	8.459	−0.194
	8.280	780000	244629	1407430	1	1261	8.270	0.010
90	8.398	971000	236291	1505381	1	1253	8.097	0.300
	8.600	1252000	234164	1515261	1	1258	8.266	0.334
	8.539	1395000	244594	1500393	1	1272	8.575	−0.036
	8.982	1410000	249320	1376565	1	1430	8.955	0.028
	8.976	1330000	253063	1357615	1	1423	8.985	−0.008
95	9.049	1205000	260474	1344000	1	1412	9.025	0.024
		1136414	260378	1412384	1	1385	8.854	−2.2%
		1055103	264307	1446243	1	1385	8.785	−0.8%
		968110	273613	1479571	1	1385	8.799	0.2%
		877236	279552	1508783	1	1385	8.765	−0.4%
2000		894255	285138	1544952	1	1385	8.796	0.4%
		1135704	288935	1585953	1	1385	8.965	1.9%
		1384650	293898	1628014	1	1385	9.157	2.1%
		1524038	302067	1658127	1	1385	9.336	2.0%
		1667532	305680	1706624	1	1385	9.411	0.8%
5		1694213	311771	1748627	1	1385	9.446	0.4%
		1598369	317973	1777732	1	1385	9.413	−0.4%
		1499024	323462	1813409	1	1385	9.352	−0.6%
		1269173	329616	1835608	1	1385	9.226	−1.3%
		1031584	335789	1857998	1	1385	9.094	−1.4%
2010		1048090	341947	1909707	1	1385	9.104	0.1%

							WSCH/E	%Chg
Research and Analysis 12/12/95	REGRESSION:	Constant	6.45158					
	Std Err of Y Est		0.21116					
	R Squared		0.846		0.68 w/n 2%		SIGNIF. @1% ?	
	No. of Observations		24		F =	24.71	YES	
	Degrees of Freedom		18		DW =	1.14	+NO	−NO
		UNEM	HSGRD	ENROLL	FIN	RPRICE		
	X Coefficient(s)	0.0000008	0.000016	−0.000002	−0.3575	0.000352		
	Std Err of Coef.	0.0000003	0.000006	0.000000	0.1610	0.000954		
	T Values	2.65	2.70	−4.21	−2.22	0.37		
	Elasticity	0.06	0.44	−0.28	−0.03	0.05		

FIGURE 3



Source: Chancellor's Office, Community Colleges, December 1995.

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TABLE 3

15–YEAR TOTAL WSCH FORECAST, CALIFORNIA COMMUNITY COLLEGES

	ACTUAL			1995 FORECAST				ADJUSTED	
year	Fall enrollment	Ave.Annual WSCH	wsch/ enroll	total enrollment	wsch/ enroll	total WSCH	% chg	CAP %	total WSCH
	953245	9341797	9.800						
	1045271	10139125	9.700						
	1176382	11471235	9.751						
1975	1331172	12437516	9.343						
	1300565	10675805	8.209						
	1366741	11764613	8.608						
	1199233	10741091	8.957						
	1290949	11193259	8.671						
1980	1430332	11979086	8.375						
	1479447	12265547	8.291						
	1400967	12050150	8.601						
	1281520	10886592	8.495						
	1183206	10315427	8.718						
1985	1215467	10259029	8.440						
	1267064	10586311	8.355						
	1307399	10885462	8.326						
	1381708	11419806	8.265						
	1455283	12050009	8.280						
1990	1505381	12641806	8.398						
	1515261	13031434	8.600						
	1500393	12812432	8.539						
	1376565	12364674	8.982						
	1357615	12186363	8.976			12186363		1.00	12186363
1995	1346754			1346754	9.049	12186363	0.0%		12186363
				1415077	8.854	12529336	2.8%		12529335
				1448973	8.785	12729892	1.6%		12729891
				1482339	8.799	13043176	2.5%		13043175
				1511589	8.765	13248812	1.6%		13248811
2000				1547779	8.796	13614276	2.8%		13614276
				1588758	8.965	14243666	4.6%		14243666
				1630795	9.157	14932600	4.8%		14932599
				1660903	9.336	15505407	3.8%		15505407
				1709398	9.411	16087083	3.8%		16087082
2005				1751420	9.446	16544580	2.8%		16544579
				1780562	9.413	16759719	1.3%		16759718
				1816280	9.352	16986329	1.4%		16986329
				1838540	9.226	16962900	−0.1%		16962900
				1860994	9.094	16924211	−0.2%		16924210
2010				1912726	9.104	17413512	2.9%		17413512

SOURCES: Chancellor's Office, December 1995, Tables 1 and 2.

Note: Enrollment prior to 1990 increased by 1.034 to reflect reporting change.

WSCH/Enrl: Artificial increase in 1995 (1995–96) with spring enrollment increase.
Decrease in 1996 with return of more BA students.
Increases after 2000, decreases after 2005 as economy slows, increases.

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FIGURE 4A

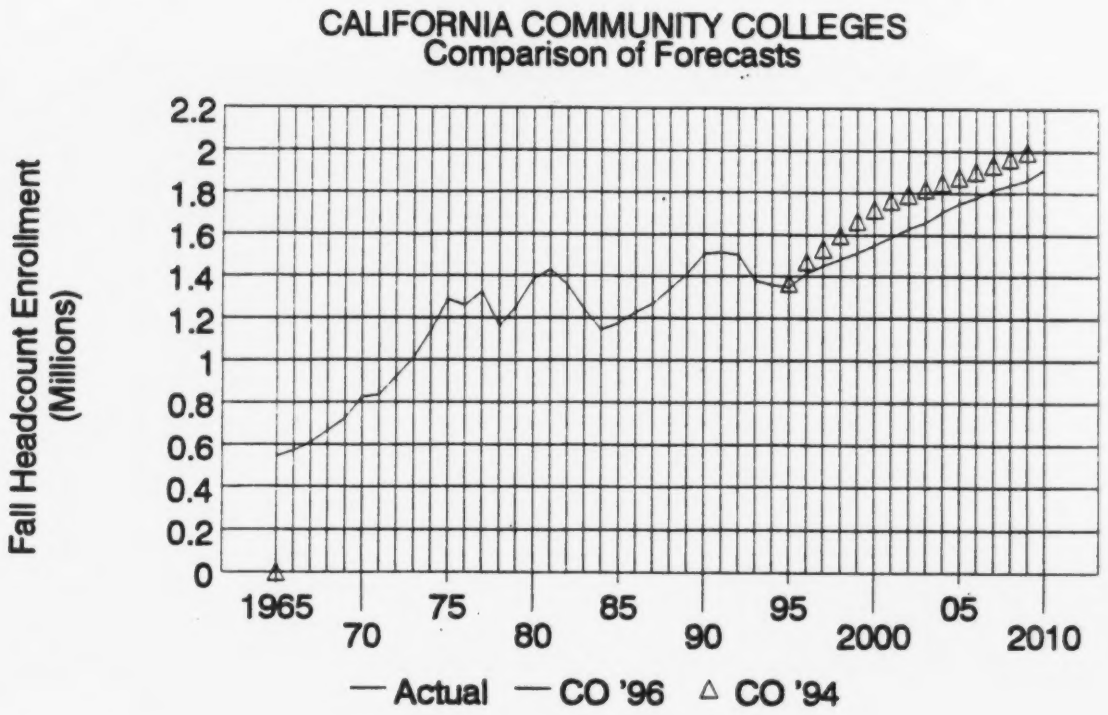
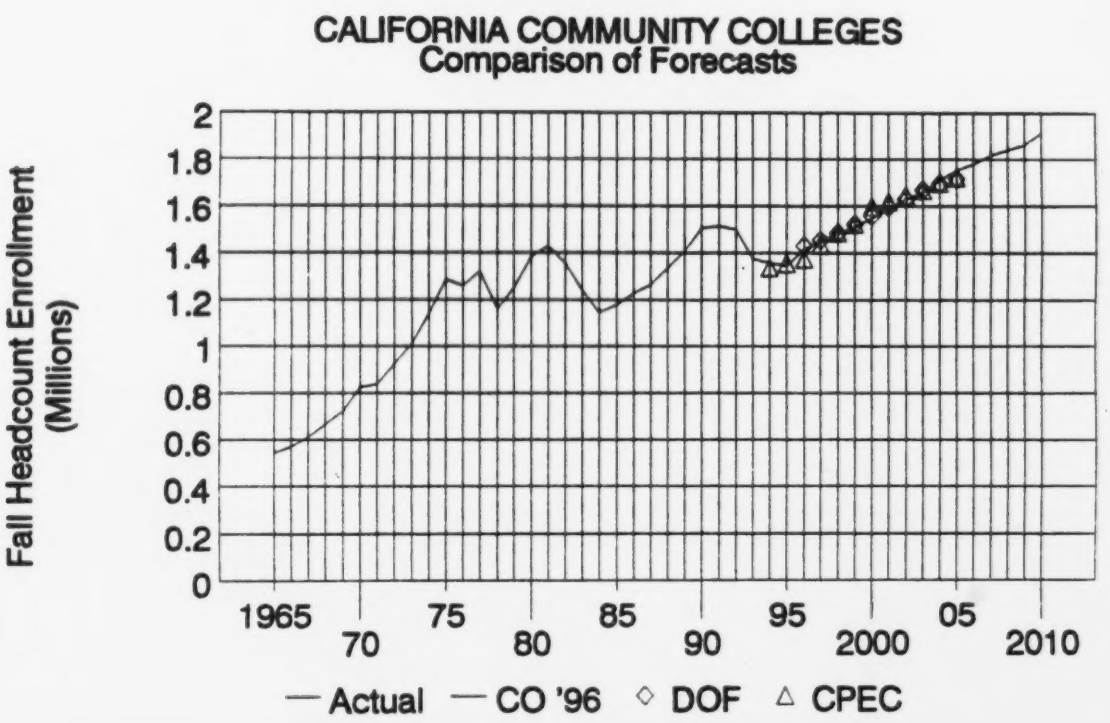


FIGURE 4B



SOURCE: Table 4. Chancellor's Office.

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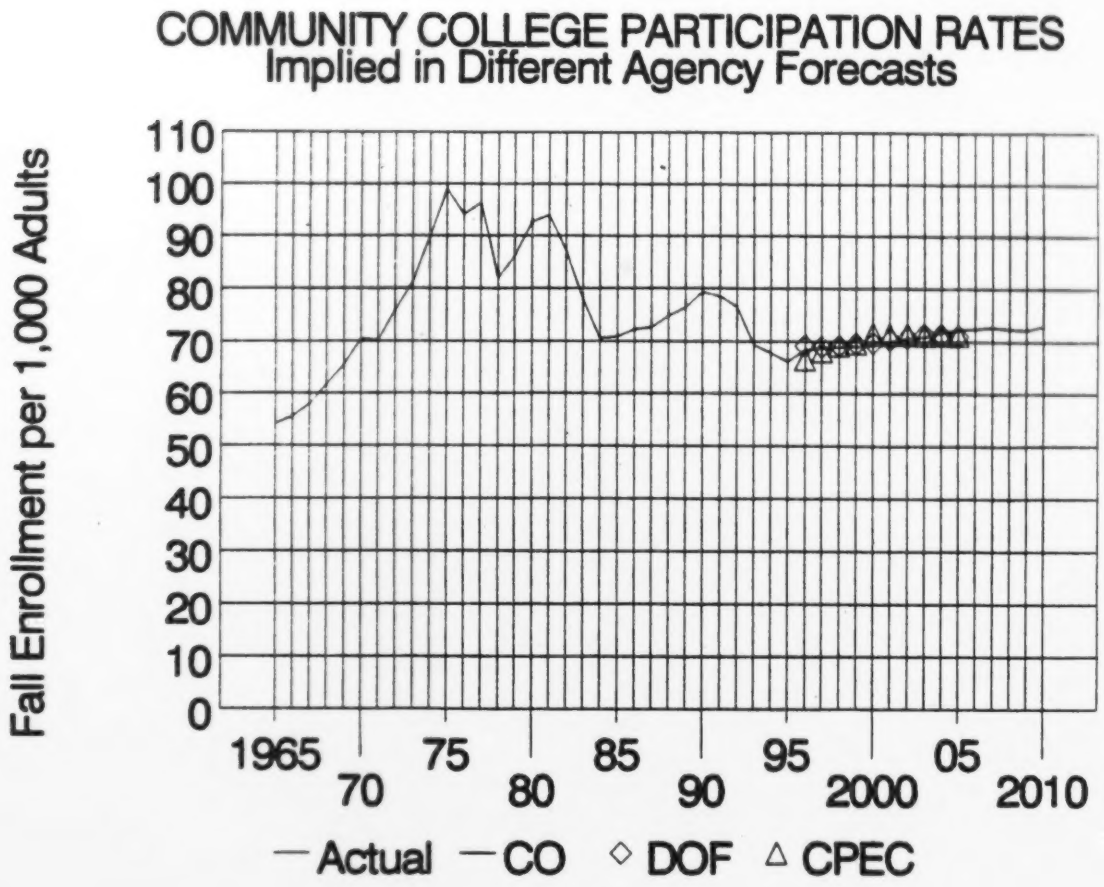
Chancellor's Office

FIGURE 4C



SOURCE: Table 4, Chancellor's Office. 01/04/96

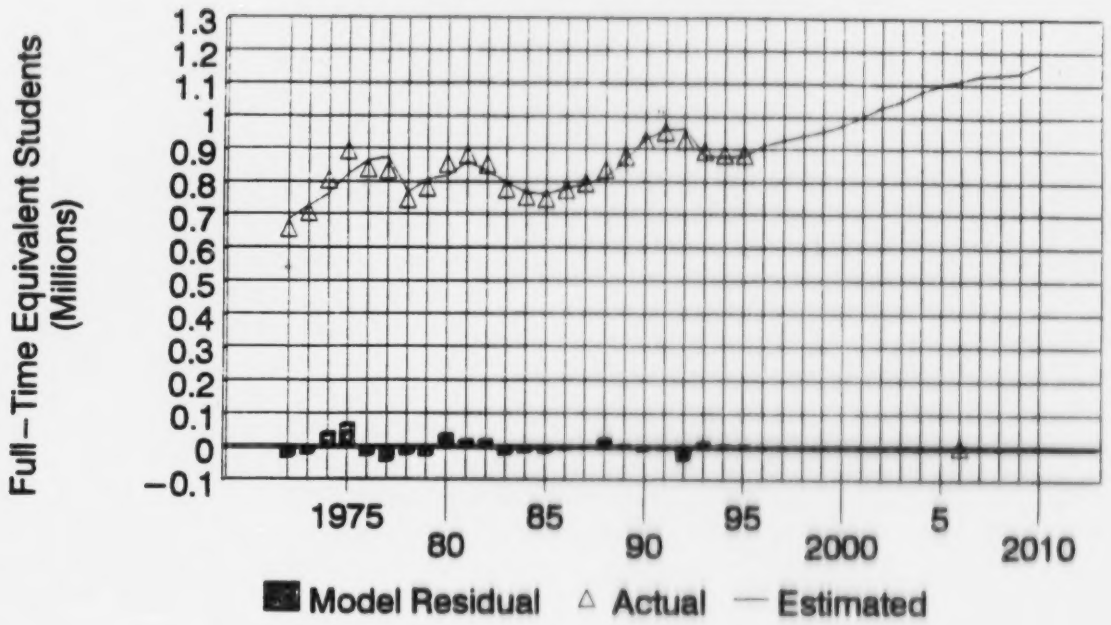
TABLE 4. PARTICIPATION RATE COMPARISON

year	ACTUAL ENROLL	adults >18	ENROLLMENT ESTIMATES CO	DOF	CPEC	ACTUAL RATES	ESTIMATED RATES CO	DOF	CPEC
1965	543225	10054500				54.0			
	570907	10279000				55.5			
	610769	10561800				57.8			
	665490	10793700				61.7			
	722429	11038300				65.4			
70	825154	11728410				70.4			
	837350	11951480				70.1			
	921900	12172840				75.7			
	1010900	12454210				81.2			
	1137700	12680108				89.7			
75	1287400	13009154				99.0			
	1257800	13370185				94.1			
	1321800	13729935				96.3			
	1159800	14143517				82.0			
	1248500	14518930				86.0			
80	1383300	14935808				92.6			
	1430800	15234710				93.9			
	1354900	15565253				87.0			
	1239381	15905036				77.9			
	1144300	16216616				70.6			
85	1175500	16585380				70.9			
	1225400	16984472				72.1			
	1264409	17421544				72.6			
	1336275	17895042				74.7			
	1407430	18429075				76.4			
90	1505381	18971688				79.3			
	1515261	19294940				78.5			
	1500393	19604016				76.5			
	1376565	19849066				69.4			
	1357615	20081300			1337085	67.6			
95	1346754	20372479	1346754		1355358	66.1	66.1		
		20698438	1415077	1430500	1374562		68.4	69.1	66.4
		21102058	1448973	1454200	1435083		68.7	68.9	68.0
		21513548	1482339	1485600	1488052		68.9	69.1	69.2
		21930911	1511589	1522100	1525501		68.9	69.4	69.6
2000		22356371	1547779	1558000	1597317		69.2	69.7	71.4
		22714072	1588758	1595300	1619693		69.9	70.2	71.3
		23077498	1630795	1631100	1646366		70.7	70.7	71.3
		23446738	1660903	1670900	1670978		70.8	71.3	71.3
		23821885	1709398	1695700	1700068		71.8	71.2	71.4
05		24203036	1751420	1717800	1722170		72.4	71.0	71.2
		24590284	1780562				72.4		
		24983729	1816280				72.7		
		25383468	1838540				72.4		
		25789604	1860994				72.2		
2010		26202238	1912726				73.0		

Source: Chancellor's Office, DOF, CPEC 12/12/95 RATES=ENROLL/1000 ADULT

FIGURE 5

15–Year FTES Forecast
CALIFORNIA COMMUNITY COLLEGES



CHANCELLOR'S OFFICE 1994 MODEL:

FTES = a + b(P(>17)) + c(B) + d(PR) + e(CA13) + f(UNE) + u

where,

FTES = total annual full–time equivalent students
P = adult population cohort
B = current expense of education (CEE) in real $ (adjusted for S&LP index)
PR = annual real $ cost to students for attending (including fees, books and supplies, transportation, and child care)
CA13 = Proposition 13; = 0 through 1977, = 1 after
UNE = unemployed
a...f are regression parameters and u = residual term

CHANCELLOR'S OFFICE 1995 ASSUMPTIONS:

(1) The economic recovery that began in early 1995, slows in 2000, picks up in 2005
(2) Adult population growth as forecast by the Department of Finance.
(3) Student price (PR), including fees + other costs, grows by CPI in future, except:
no change in $13/unit enrollment fee in 1996 (96–97) and
sunset of $50/unit "differential" fee in 1996 (1/96); together with
slight increase in waivers.
(4) Real CEE is unchanged from 1994–95 to 1995–96, then grows by:
2.6% in 1996 (1996–97)
and the following average annual rates:
2.2% between 1995 and 2000
0.7% between 2000 and 2005
2.4% between 2005 and 2010

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TABLE 5	FTES	UNEMP	ADULTS	FIN	RCEE'95	RPRC'95	enrollEST.	act−est.
	656293	661168	12172840	0	1891986	1303	685356	−29063
	706972	663259	12454210	0	2063526	1303	726112	−19139
	805151	660140	12680108	0	2221870	1303	762607	42544
1975	891926	871378	13009154	0	2392404	1303	821984	69943
	837385	925429	13370185	0	2529655	1303	861855	−24469
	833615	814000	13729935	0	2597151	1303	873431	−39816
	747182	738000	14143517	1	2607312	1289	767458	−20276
	781070	746000	14518930	1	2618690	1234	806191	−25121
80	853550	832000	14935808	1	2547014	1217	816188	37362
	880529	1043000	15234710	1	2544951	1176	860285	20244
	851936	1199000	15565253	1	2385735	1209	831284	20652
	778781	1084000	15905036	1	2260410	1219	798115	−19334
	755603	971000	16216616	1	2335616	1303	767839	−12236
85	748071	912000	16585380	1	2279543	1298	761456	−13385
	777032	840000	16984472	1	2341380	1291	779910	−2878
	796187	770000	17421544	1	2356145	1276	793363	2824
	837092	743000	17895042	1	2416782	1275	813568	23524
	876231	780000	18429075	1	2590062	1261	869977	6254
90	925139	971000	18971688	1	2741367	1253	932008	−6869
	952654	1252000	19294940	1	2725915	1258	957033	−4379
	927365	1395000	19604016	1	2693355	1272	961734	−34369
	893475	1410000	19849066	1	2641951	1430	878120	15355
	883975	1330000	20081300	1	2629935	1423	877309	6666
95	883975	1205000	20372479	1	2629935	1412	878008	5967
		1138414	20698438	1	2698313	1385	912857	3.3%
		1055102	21102058	1	2765771	1385	927726	1.6%
		968109.	21513548	1	2832150	1385	942223	1.6%
		877236.	21930911	1	2888793	1385	954535	1.3%
2000		894254.	22356371	1	2932125	1385	973519	2.0%
		1135703	22714072	1	2932125	1385	1001470	2.9%
		1384649	23077498	1	2932125	1385	1030179	2.9%
		1524037	23446738	1	2932125	1385	1049659	1.9%
		1667532	23821885	1	2976106	1385	1078532	2.8%
5		1694212	24203036	1	3035629	1385	1100714	2.1%
		1598368	24590284	1	3096341	1385	1112809	1.1%
		1499023	24983729	1	3173750	1385	1128119	1.4%
		1269173	25383468	1	3253093	1385	1132816	0.4%
		1031584	25789604	1	3334421	1385	1137386	0.4%
2010		1048089	26202238	1	3417781	1385	1164183	2.4%

	Constant	Constant	650910			Est.enroll	%Chg
	Std Err of Y Est		30042.				
12/14/95	R Squared		0.872			SIGNIF. @1% ?	
Research	No. of Observations		24	F =	30.69	YES	
and			18	DW =	1.59	+NO	−NO
Analysis		UNEM	ADULTS	FINANCE	RCEE	RPRICE	
	X Coefficient(s)	0.085	0.021	−117056	0.203	−503	
	Std Err of Coef.	0.039	0.006	26753	0.038	136	
	T Values	2.22	3.64	−4.38	5.29	−3.69	
	Elasticity	0.10	0.40	−0.11	0.60	−0.78	

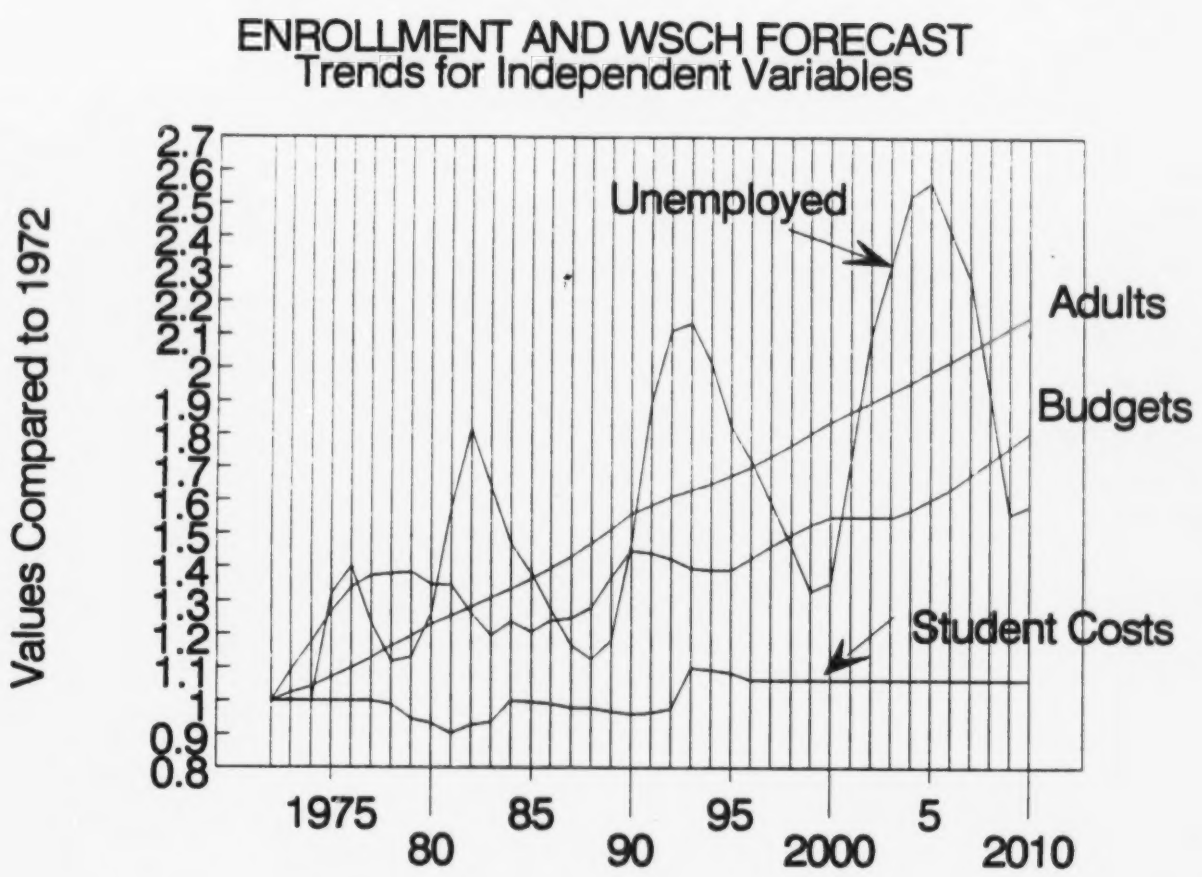
TABLE 6

COMPARISON OF FORECASTING MODEL VARIATIONS

		Dependent Variables				
		Total Enroll	WSCH/ Enroll	FTES	Full–Time Enroll	Part–Time Enroll
RSq.		0.941	0.846	0.872	0.830	0.956
F		72.3	24.7	30.7	20.7	91.4
DW		1.80	1.14	1.59	1.92	2.17
Independent Variables						
CC Price	t	−6.89	0.37	−3.69	−2.26	−7.52
	e	−1.27	0.05	−0.78	−1.03	−1.49
4Yr Fee	t				2.39	
	e				0.20	
Budget	t	7.78		5.29	3.74	8.46
	e	0.77		0.60	0.74	0.98
Finance	t	−4.10	−2.22	−4.38	−3.72	−3.58
	e	−0.09	−0.03	−0.11	−0.13	−0.09
Adults	t	5.21		3.64		6.28
	e	0.50		0.40		0.76
H.S.Grads	t		2.70		0.85	
	e		0.44		0.35	
Unemployed	t	2.14	2.65	2.22	0.93	2.47
	e	0.08	0.08	0.10	0.09	0.11
Enrollment	t		−4.21			
	e		−0.28			
Data	t					−3.16
	e					−0.09

SOURCE: Chancellor's Office, Research and Analysis Unit, December 1995.
NOTE: t values are significant at the 5% level for values above 2.1.

FIGURE A



SOURCE: Table A.

NOTE: Actuals from 1972 to 1995; estimated from 1996 to 2010.

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TABLE A
VALUES FOR FORECASTING MODEL'S INDEPENDENT VARIABLES

year	UNEMPLOYED #	UNEMPLOYED %Chg	ADULTS #	ADULTS %Chg	BUDGET #	BUDGET %Chg	STUDENT COST	STUDENT COST
	661168		12172840		$1,891,986		$1,303	
	663259	0.3%	12454210	2.3%	$2,063,526	9.1%	$1,303	0.0%
	660140	−0.5%	12680108	1.8%	$2,221,870	7.7%	$1,303	0.0%
1975	871378	32.0%	13009154	2.6%	$2,392,404	7.7%	$1,303	0.0%
	925429	6.2%	13370185	2.8%	$2,529,655	5.7%	$1,303	0.0%
	814000	−12.0%	13729935	2.7%	$2,597,151	2.7%	$1,303	0.0%
	738000	−9.3%	14143517	3.0%	$2,607,312	0.4%	$1,289	−1.1%
	746000	1.1%	14518930	2.7%	$2,618,690	0.4%	$1,234	−4.3%
80	832000	11.5%	14935808	2.9%	$2,547,014	−2.7%	$1,217	−1.4%
	1043000	25.4%	15234710	2.0%	$2,544,951	−0.1%	$1,176	−3.3%
	1199000	15.0%	15565253	2.2%	$2,385,735	−6.3%	$1,209	2.8%
	1084000	−9.6%	15905036	2.2%	$2,260,410	−5.3%	$1,219	0.8%
	971000	−10.4%	16216616	2.0%	$2,335,616	3.3%	$1,303	6.9%
85	912000	−6.1%	16585380	2.3%	$2,279,543	−2.4%	$1,298	−0.4%
	840000	−7.9%	16964472	2.4%	$2,341,380	2.7%	$1,291	−0.6%
	770000	−8.3%	17421544	2.6%	$2,356,145	0.6%	$1,276	−1.1%
	743000	−3.5%	17895042	2.7%	$2,416,782	2.6%	$1,275	−0.1%
	780000	5.0%	18429075	3.0%	$2,590,062	7.2%	$1,261	−1.1%
90	971000	24.5%	18971688	2.9%	$2,741,367	5.8%	$1,253	−0.6%
	1252000	28.9%	19294940	1.7%	$2,725,915	−0.6%	$1,258	0.4%
	1395000	11.4%	19604016	1.6%	$2,693,355	−1.2%	$1,272	1.1%
	1410000	1.1%	19849066	1.2%	$2,641,951	−1.9%	$1,430	12.4%
	1330000	−5.7%	20081300	1.2%	$2,629,935	−0.5%	$1,423	−0.5%
95	1205000	−9.4%	20372479	1.4%	$2,629,935	0.0%	$1,412	−0.8%
	1138414	−5.5%	20698438	1.6%	$2,698,313	2.6%	$1,385	−2.0%
	1055103	−7.3%	21102058	2.0%	$2,765,771	2.5%	$1,385	0.0%
	968110	−8.2%	21513548	1.9%	$2,832,150	2.4%	$1,385	0.0%
	877236	−9.4%	21930911	1.9%	$2,888,793	2.0%	$1,385	0.0%
2000	894255	1.9%	22356371	1.9%	$2,932,125	1.5%	$1,385	0.0%
	1135704	27.0%	22714072	1.6%	$2,932,125	0.0%	$1,385	0.0%
	1384650	21.9%	23077498	1.6%	$2,932,125	0.0%	$1,385	0.0%
	1524038	10.1%	23446738	1.6%	$2,932,125	0.0%	$1,385	0.0%
	1667532	9.4%	23821885	1.6%	$2,976,106	1.5%	$1,385	0.0%
5	1694213	1.6%	24203036	1.6%	$3,035,629	2.0%	$1,385	0.0%
	1598369	−5.7%	24590284	1.6%	$3,096,341	2.0%	$1,385	0.0%
	1499024	−6.2%	24983729	1.6%	$3,173,750	2.5%	$1,385	0.0%
	1269173	−15.3%	25383468	1.6%	$3,253,093	2.5%	$1,385	0.0%
	1031584	−18.7%	25789604	1.6%	$3,334,421	2.5%	$1,385	0.0%
2010	1048090	1.6%	26202238	1.6%	$3,417,781	2.5%	$1,385	0.0%

SOURCE: Chancellor's Office, Department of Finance, Employment Development Department, December 1995.

NOTE: Except for a few estimates, numbers from 1972 through 1995 are reported actuals. Numbers for 1996 and beyond are estimates either by the State Department of Finance (population) or Chancellor's Office.

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